

**UNITED STATES DEPARTMENT OF COMMERCE****Patent and Trademark Office**

Address: COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20231

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
-----------------	-------------	----------------------	---------------------

08/897,839 07/21/97 NISHIMOTO

Y

<input type="checkbox"/>	<input type="checkbox"/>	EXAMINER
--------------------------	--------------------------	----------

MMC2/0705

LORUSSO & LOUD
3137 MT VERNON AVENUE
ALEXANDRIA VA 22305

EATON, K

ART UNIT	PAPER NUMBER
----------	--------------

2823

DATE MAILED:

07/05/00

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary	Application No.	Applicant(s)
	08/897,839	NISHIMOTO ET AL.
Examiner	Art Unit	
Kurt M. Eaton	2823	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).

Status

- 1) Responsive to communication(s) filed on 23 May 2000.
- 2a) This action is FINAL. 2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 33, 35-37, and 39-42 is/are pending in the application.
 - 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) Claim(s) _____ is/are allowed.
- 6) Claim(s) 33, 35-37, and 39-42 is/are rejected.
- 7) Claim(s) _____ is/are objected to.
- 8) Claims _____ are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on _____ is/are objected to by the Examiner.
- 11) The proposed drawing correction filed on _____ is: a) approved b) disapproved.
- 12) The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

- 13) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).
 - a) All b) Some * c) None of the CERTIFIED copies of the priority documents have been:
 1. received.
 2. received in Application No. (Series Code / Serial Number) _____.
 3. received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.
- 14) Acknowledgement is made of a claim for domestic priority under 35 U.S.C. & 119(e).

Attachment(s)

15) <input type="checkbox"/> Notice of References Cited (PTO-892)	18) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____
16) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)	19) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)
17) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____	20) <input type="checkbox"/> Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 33-39, 41, and 42 are rejected under 35 U.S.C. 103(a) as being unpatentable over Matsuura, as previously applied in the office action mailed 2/3/00.
3. Claim 40 is rejected under 35 U.S.C. 103(a) as being unpatentable over Matsuura as applied to claim 37 above, and further in view of Harriott, as previously applied in the office action mailed 2/3/00.

Response to Arguments

4. Applicant's arguments filed 5/23/00 have been fully considered but they are not persuasive.
5. In response to applicants assertion that the embodiments of Figures 1A-1E only teach wherein a first conductive layer is covered with a layer of insulating film which is a TEOS-APCVD oxide film having tension stress, the examiner respectfully submits the following. The invention of Matsuura is generally directed towards improvements in a semiconductor device including an interlayer insulating film mutually insulating a first layer and a second layer of conductor patterns {column 1, lines 14-16} and, in Figures 1A-1E, teaches providing a first layer of conductor patterns (12); forming an interlayer insulating film (14) over the first layer of conductor patterns; and forming

a second layer of conductor patterns (18) over the interlayer insulating film. Matsuura also discloses that the interlayer insulating film naturally retains tensile stress {column 7, lines 6-8} and, accordingly, discloses various methods by which to predict and reduce the occurrence of cracks - a deleterious phenomenon associated with the intrinsic tensile stress of the interlayer insulating film (14) {see Figures 2A-2C and 3A-3C; column 5, line 20 – column 6, line 46}. Matsuura then discloses, in an alternate embodiment, another means to control and reduce the occurrence of cracks in the interlayer insulating film (14) by forming compressively stressed insulating layers (13) and (16) on the bottom and the top of the interlayer insulating film (14) {see Figures 5A and 5B; column 6, line 62 – column 7, line 20}. The examiner respectfully submits that upon reading Matsuura as a whole, one of ordinary skill in the art readily recognizes that there is no explicit teaching that the interlayer insulating film (14) discussed in the alternate embodiment with Figures 5A and 5B is not the same interlayer insulating film (14) discussed in the embodiment pertaining to Figures 1A-1E. Thus, one of ordinary skill in the art would logically deduce that the alternate method of preventing crack formation discussed with reference to Figures 5A and 5B is intended to be substituted in place of the interlayer insulating film (14) discussed with reference to Figures 1A-1E.

6. Pertaining to applicants argument that the examiners' reason for obviousness invokes a "boilerplate" type rule to the effect that "duplication of essential working steps" is obvious and that "boilerplate" rules no longer provide a legally permissible basis for a *prima facie* case of obviousness, the examiner respectfully submits that a legal precedent can provide the rationale supporting obviousness only if the facts in the case are sufficiently similar to those in the instant application {see MPEP 2144.04}. Under the aforementioned scenario, duplication of parts is a permissible reason for obviousness (see *In re Harza*, 274 F.2d 669, 124 USPQ 378 (CCPA 1960)). In the instant case, the claims are directed to the repetition of a group of steps including: (a1) forming a

first insulating layer with a first type of stress; (b1) forming a second insulating layer with a second type of stress, different from the first type of stress; (c1) forming a conductive interconnection layer on and in contact with the second insulating layer; and (d1) forming a third insulating layer with the second type of stress on and in contact with the conductive interconnection layer such that each of the conductive interconnection layers is sandwiched between, and having opposing surfaces in contact with, insulating layer having the same type of stress. Matsuura teaches, in Figures 5A and 5B (a2) forming a conductive interconnection layer over an existing layer; (b2) forming a first insulating layer with a first type of stress; (c2) forming a second insulating layer with a second type of stress, different from the just previously described first type of stress; and (d2) forming a third insulation layer with the just previously mentioned first type of stress on the second insulating layer. Although Matsuura does not expressly disclose repeating the steps (a2)-(d2) in order to form a conductive interconnection layer over the third insulating layer (step (a2)) followed by steps of (b2)-(d2) mere duplication of the steps of Matsuura forms the same structure and includes the same method as instantly claimed and has no patentable significance since no new or unexpected result is produced. If applicants structure produced by the claimed method contains a new or unexpected result over the prior art, the claims do not reasonably enable one of ordinary skill in the art to achieve it and the applicant must enable one of ordinary skill in the art to achieve the improvement by amending the claims in such as way as to enable improvements over the prior art.

7. With regard to applicants assertion that Matsuura specifically teaches away from applicants claimed invention because Matsuura shows, in Figure 6A, providing a first layer of aluminum alloy wire (34) and a second layer of aluminum alloy (36) separated by a single insulating layer (35), the examiner would like to continue the discussion from paragraph 5 of the instant Office Action. The examiner respectfully submits that upon reading Matsuura as a whole, one of ordinary skill in the art

readily recognizes that there is no explicit teaching that the interlayer insulating film (14) discussed in the alternate embodiment with Figures 5A and 5B cannot be the same interlayer insulating film (35) discussed in the embodiment pertaining to Figure 6A. Thus, one of ordinary skill in the art, absent of any teaching otherwise, would logically deduce that the alternate method of preventing crack formation discussed with reference to Figures 5A and 5B could be intended to be substituted in place of the interlayer insulating film (14) discussed with reference to Figure 6A.

Conclusion

8. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

9. Paper related to this application may be submitted directly to Art Unit 2823 by facsimile transmission. Papers should be faxed to Art Unit 2823 via the Art Unit 2823 Fax Center located in Crystal Plaza 4, room 4C23. The faxing of such papers must conform with the notice published in the Official Gazette, 1096 OG 30 (15 November 1989). The Art Unit 2823 Fax Center number is (703) 308-7722 or -7724. The Art Unit 2823 Fax Center is to be used only for papers related to Art Unit 2823 applications.

Any inquiry concerning this communication or earlier communication from the examiner should be directed to **Kurt Eaton** at (703) 305-0383 and between the hours of 8:00 AM to 4:00 PM (Eastern Standard Time) Monday through Friday or by e-mail via kurt.eaton@uspto.gov.



OLIK CHAUDHURI
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800